

Additional Species of *Primula* from the Burma-Tibet Frontier

BY

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The recent exploration in 1926-7 of Captain Kingdon Ward into the area lying between the Himalaya and the main mass of the Chinese Alps has added to our knowledge of the distribution of the Asiatic members of the genus *Primula* and has brought to light several new species. This intermediate area has naturally links with both the above centres, some species being of Himalayan affinity; others connect with the flora of the Western provinces of China.

The new species are as follows:—

- Primula blandula*, W. W. Sm. (*Auriculata*) p. 299.
- „ *calthifolia*, W. W. Sm. (*Petiolaris*) p. 300.
- „ *chamaethauma*, W. W. Sm. (*Petiolaris*) p. 300.
- „ *euchaites*, W. W. Sm. (*Muscarioides*) p. 301.
- „ *fea*, Ward. (*Soldanelloides*) p. 302.
- „ *melanodonta*, W. W. Sm. (*Candelabra*) p. 303.
- „ *siphonantha*, W. W. Sm. (*Soldanelloides*) p. 303.

***Primula blandula*, W. W. Sm. Sp. nov.**

Planta ex affinitate *P. stenocalycis*, Maxim. a qua habitu minore, calyce multo brevior haud pergamentaceo, bracteis sub anthesin quam pedicelli brevioribus recedit; folia etiam magis denticulata quam ea *P. stenocalycis* ubi plerumque integra.

Radices fibrosae graciles. Folia rosulata, numerosa, vix 2 cm. longa, 5-8 mm. lata, spathulata vel subelliptica, obtusa vel subacuta, in petiolum brevem vix discretum attenuata, margine acutiuscule denticulata, supra pilis farinipotentibus minute scaberula, infra albo-farinosa nunc sparsius, costa nervisque pagina inferiore conspicuis. Scapus 3-5 cm. altus supra albo-farinosus 1-7-florus; bractee lineari-lanceolatae, acutae, circ. 3 mm. longae, basi gibbosae, farinosae, ut pedicelli 5 mm. longi. Calyx 5 mm. longus tubulosus sparsim farinosus lobis oblongis subacutis circ. 3 mm. longis. Corolla purpurea, in sicco compressa circ. 1.5 cm. lata, obscure farinosa, ore annulato flavo; tubus 5-7 mm. longus; lobi circ. 5 mm. longi, obovati, saepe ultra medium divaricatim bilobulati. Stamina in flore brevistylo supra medium inserta, in flore longistylo a basi 2 mm. remota. Stylus prioris 1 mm. longus ovarium globosum subaequans; alter 5 mm. longus.

"Burma-Tibet Frontier: Seinghku Wang. Lat. $28^{\circ} 8' N$. Long. $97^{\circ} 24' E$. Alt. 11-12,000 ft. Flowers bright purple, with crimson tube and bright yellow eye. On ledges of granite cliffs and steep turf slopes. Scattered, not very abundant on gravel slopes higher up the valley. June 13th 1926." F. K. Ward. Nos. 6911, 7016, 7055, 6830.

This dwarf species finds its nearest affinity in *P. stenocalyx*, Maxim. The Kansu plant is, however, larger and has a characteristic calyx.

***Primula calthifolia*, W. W. Sm. Sp. nov.**

Species ex affinitate *P. sonchifoliae*, Franch. a qua foliis subrotundatis, floribus flavis facile cognoscitur; etsi apud *Petiolaris* posita, aliquatenus anomala.

Rhizoma robustum radices multas crassas emittens. Folia exteriora squamiformia imbricata rubida; interiora haud bene evoluta; lamina suborbicularis, circ. 2 cm. diametro, margine denticulata, in sicco membranacea, epilosa, glandulis farinipotentibus conspersa; petiolus late alatus laminam subaequans. Scapus in specimine unico circ. 12 cm. altus, triflorus, infra glaber, supra sub umbella farinosus subnigrescens; pedicelli 5-10 mm. longi dense nigrescenti-farinosi; bractae lineari-lanceolatae acuminatae circ. 3 mm. longi. Calyx cupularis carnosulus 6-7 mm. longus in lobos ovatos subacutos fere ad medium fissus. Corolla circ. 1.8 cm. longa, in sicco expansa ad 2 cm. lata, flava, farinosa; lobi oblongi emarginati. Stamina in flore brevistylis apud os corollinum inserta. Stylus in eodem flore calyce paulo brevior; ovarium globosum.

"Burma-Tibet Frontier: Seinghku Wang. Lat. $28^{\circ} 8' N$. Long. $97^{\circ} 25' E$. Alt. 11-12,000 ft. Flowers primrose yellow. Leaves scarcely developed. On steep stony mud slides beneath the shadow of *Rhododendron* scrub above, in South-facing gullies. A few plants seen but only one in bloom; the snow has only recently melted here. June 10th 1926." F. K. Ward. No. 6897.

There is, unfortunately, only one specimen of this and the flower has not been dissected. Apparently a member of the Series *Petiolaris* for leaf and calyx favour that section rather than *Nivalis*.

***Primula chamaethauma*, W. W. Sm.**

Species ex affinitate *P. sonchifoliae*, Franch. atque *P. petiolaris* Wall.; foliis floribusque coetaneis, foliis glabris, floribus haud immersis cum eis congruit; scapo nullo vel subnullo, pedicellis elongatis gracilibus, floribus pro planta magnis in sicco 2.5 cm. latis inter alia conspicua.

Rhizoma breve satis crassum, radices multas crassas emittens. Folia exteriora squamiformia, late ovata, ad anthesin carnosa, interiora

cum floribus nascentia, elliptica vel oblonga, 2-4 cm. longa, 1-1.5 cm. lata (haud adulta), apice obtusa, basi vix petiolata, margine breviter atque irregulariter lacerata, textura chartacea, glabra, glandulis farinipotentibus hic illic conspersa. Scapus haud evolutus; flores pedicellis gracilibus ad 6 cm. longis sparsim farinosis (apice densius) suffulti. Calyx cupularis carnosus 7-9 mm. longus farina conspersus in lobos ovatos vel subtriangulares obtusos vel nunc subacutos plerumque integros ad medium fissus. Corolla laete violacea, flavo-oculata, pro planta magna; limbus in dissectione expansus ad 3.5 cm. latus; lobi anguste obovati, plus minusve alte emarginati, nunc paulo lacerati; tubus circ. 1.5 cm. longus annulatus. Stamina in flore brevistylis supra medium tubum inserta, filamentis brevibus, antheris 2.5 mm. longis ab annulo 2 mm. remotis. Stylus in eodem flore vix 5 mm. longus, calyce brevior; ovarium globosum.

"Burma-Tibet Frontier: Seinghku Wang. Lat. 28° 8' N. Long. 97° 24' E. Alt. 12-13,000 ft. Flowers bright violet with yellow eye. Calyx and corolla tube lightly powdered with meal. Scattered on stony alpine slopes, amongst boulders in rich black loam. The plant forms large clumps like the Primrose; these are widely scattered and the plant is apparently not abundant. I have seen five or six clumps. June 15th-18th 1926.

"28th June. Immensely abundant in the high alpine region, on turf slopes, where it forms sheets of colour. Ascends to 14-15,000 ft. and grows on both sides of the pass. (Diphuk La.) In bloom till mid-July.

"The habit and flower recall *P. sonchifolia* but unlike that species, this is a true alpine, not occurring below 12,000 ft. and most abundant at 13-14,000 ft. on turf slopes. It looks like a *Petiolaris*, though the seeds are not of the *Petiolaris* type." F. K. Ward. No. 6928.

***Primula euchaites*, W. W. Sm. Sp. nov.**

Species ex affinitate *P. bellidifoliae*, King et *P. gracilentae*, Dunn; planta efarinosa foliis subintegris obscure denticulatis scapo et bracteis et calyce una cum foliis hirsutulis in sectione *Muscarioides* bene notata.

Planta pusilla circ. 8 cm. alta. Folia petiolo laminam subaequante alato flaccido hirsutulo praedita; lamina anguste ovalis, circ. 3.5 cm. longa, circ. 1 cm. lata, apice rotundata, basi cuneata, margine subintegra, denticulis minutis obscure notata, pilis minutis articulatis albidis undique conspersa. Scapus flexilis umbellam 5-floram gerens; bractae forma irregulares, nunc lineares, interiores plus minusve ovatae, hirsutulae. Flores quoad magnitudinem cum eis *P. gracilentae* fere congruunt. Calyx hirsutulus fere ad basin in lobos acutos divisus. Corolla violacea, subglabra, circ. 1.2 cm. longa in sicco; tubus 7 mm. longus; lobi anguste obcordati, late emarginati. Stamina in flore longistylis sub medium tubum inserta, stylo ad os pertinente.

"Burma-Tibet Frontier: Seinghku Wang. Lat. 28° 8' N. Long. 97° 24' E. Alt. 13,000 ft. Flowers violet, fading to white towards the centre but without meal. Not scented. Leaves, scape, bracts and calyx hairy but no meal. Hanging down from grassy ledges of limestone cliffs. Only two specimens seen nor did further search on these cliffs yield any more. July 6th 1926." F. K. Ward. No. 7052.

As only one specimen was collected—the second specimen seen not being accessible—the above description is based on slender material which does not permit of the dissection of the one capitulum.

***Primula fea*, Ward. Sp. nov.**

Inter species descriptas tantum cum *P. sapphirina*, Hook. fil. comparanda, a qua floribus majoribus, corollae lobis subintegris inter alia recedit.

Planta pusilla pulcherrima circ. 4 cm. alta. Folia circ. 1 cm. longa, spatulata vel oblanceolata, in petiolum alatum laminae subaequalem angustata, pinnatifido-dentata, supra albido-puberula. Scapus filiformis 1-2-florus glaber efarinosus; flores sessiles nutantes; bractee irregulares, 1-2 mm. longae, lineares vel lanceolatae vel oblongae. Calyx 3-4 mm. longus, cupularis, viridis vel nigrescens, ad medium vel ultra fissus; lobi irregulares, oblongi, obtusi vel acutati, integri vel nunc incisi vel denticulati, intus minute farinosi. Corolla campanulata, circ. 1 cm. longa, in sicco complanata fere 9 mm. lata, subcoerulea; tubus basi kermesinus, gradatim ampliata sed vix in modum *Primulae soldanelloides*; lobi 4 mm. longi, ovati, plerumque integri vel subintegri, nunc irregulariter incisi. Stamina in speciminibus nostris fere ad os corollinum pertinentia stylo paululo breviora. Capsula globosa.

"Burma-Tibet Frontier: Seinghku Wang. Lat. 28° 8' N. Long. 97° 24' E. Alt. 14-15,000 ft. Flowers blue in bud, mauve when open, with crimson tube. Almost exactly the colour of *Isopyrum grandiflorum*. Anthers cream. Scape with one or two flowers. Leaves minute, regularly incised, slightly hairy above, on long more or less sheathing petioles. Embedded in moss or lichen, in crevices of the otherwise almost bare granite cliffs, facing due South. Also scattered on precipitous broken slopes of turf and rock. The cut leaves with an attempt at downiness suggest *Soldanelloides* but the flowers again lead to *Amethystinae*. The dark almost black purple calyx is partly powdered with very fine greenish yellow meal, well seen with a low power of the microscope. The stamens are inserted at (near?) the base of the tube on very short filaments. In short-styled flowers the style just exceeds the stamens in length; in long-styled flowers the stigma just reaches the top of the tube. Capsule globular. Calyx teeth minutely toothed. June 30th 1926." F. K. Ward. No. 7020.

This species is evidently the eastern representative of the Sikkim *P. sapphirina*, Hook. f. The height and foliage are similar in the

two species. The flower of *P. fea* is larger, with more elongate corolla and a crimson tube.

***Primula melanodonta*, W. W. Sm. Sp. nov.**

Species valde affinis *P. serratifoliae*, Franch. a qua foliis multo minoribus magis membranaceis grossius atque aliter denticulatis recedit; quoad flores persimilis sed calycis lobis nigrescentibus et corollae colore uniformi notata.

Planta 15-25 cm. alta habitu *P. serratifoliae*. Folia 3-5 cm. longa, 1.2-1.8 cm. lata, oblanceolata vel nunc obovata, apice rotundata vel obtusa, basi in petiolum alatum vix discretum angustata, margine pro magnitudine grossi-denticulata, in sicco tenuiter membranacea, glabra. Scapus efarinosus umbellam plerumque 3-5-floram gerens; nunc umbella secundaria praesens; bractae lineares vel lineari-lanceolatae; pedicelli 5-10 mm. longi. Flores quoad magnitudinem formamque cum eis *P. serratifoliae* congruunt; calycis dentes nigrescentes; corolla laete flava vel sulfureo-flava, oculo aurantiaco.

"Burma-Tibet Frontier: Seinghku Wang. Lat. 28° 8' N. Long. 97° 24' E. Alt. 11-12,000 ft. Flowers sulphur yellow, becoming darker and greenish yellow in the centre; slightly fragrant. On alpine turf slopes, in mud, by streams. Abundant but few plants in flower yet. June 12th 1926.

"Sometimes two whorls of flowers are produced, usually there is only one. The most abundant species between 11,000 and 13,000 ft., occurring in thousands along the banks of streams, on grassy slopes, on boulders, etc. This and the *Omphalogramma* No. 6821 [*Souliei*] are the two commonest species and have a good range in altitude. June 27th." F. K. Ward. No. 6901, 7042.

"Valley of the Seinghku. Autumn flowering. There are patches of several score of plants in flower here and there. No scent. Plants alongside the flowering specimens are shedding their seeds. The autumn-flowering specimens set no seed as far as I have been able to observe. Oct. 5th 1926." F. K. Ward. No. 7536.

Certainly a very close ally of *P. serratifolia*, Franch. which occurs in the same area but at a higher altitude. The new species is very like its ally in the features of its inflorescence but has very different foliage.

***Primula siphonantha*, W. W. Sm. Sp. nov.**

Species affinis *P. Cawdoriana*, Ward, in sectione *Soldanelloides*, a qua foliis magis elongatis denticulatis nec grosse serratis, floribus minoribus praeter alia signa distinguitur.

Planta perennis subcaespitosa 20-25 cm. alta. Folia plerumque 5-8, petiolata; lamina 3.5-6.5 cm. longa, 1-1.5 cm. lata, oblanceolata, apice subobtusata vel nunc paulo acutata, basi in petiolum 0.5-2.5 cm.

longum haud bene discretum alatum sensim angustata, margine irregulariter sinuato-denticulata atque ciliolata, in sicco submembranacea, utrinque sub anthesin viridis nec farinosa sed pilis glandulosis farinipotentibus minute scabridula, infra ad costam nervosque pilis longioribus albidis praedita; nervi laterales haud conspicui angulo acuto abeuntes. Scapus ad 25 cm. longus, apice tantum conspicue farinosus sed sub lente ubique pilis minimis farinipotentibus conspersus, flores deflexos 4-5 evolutos in capitulo terminali gerens; bractae parvae subrotundatae virides intus albo-farinosae capitulum coronantes. Calyx cupularis circ. 3.5 mm. longus ad medium in lobos 5 saepe inaequales ovatos vel rotundato-oblongos obtusos divisus, extra viridis atque pilis farinipotentibus vestitus, intus dense albo-farinosus. Corolla elongata circ. 1.7 cm. longa pallide violacea ubique pilis minimis farinipotentibus conspersa; tubi pars inferior cylindrica tantum 3-4 mm. longa, pars superior anguste subcylindrico-inflata lobata; lobi anguste oblongi, 3 mm. longi, haud reflexi, apice breviter 2-3-inciso-denticulati; os in flore longistylis (ad apicem tubi inferioris) exannulatum. Stamina in flore longistylis filamentis brevissimis a basi corollae tantum 3 mm. remota. Stylus in flore longistylis stamina paululo superans circ. 2.5 mm. longus, stigmatibus capitatis; ovarium subglobosum. Capsula circ. 3-4 mm. diametro valvis quinque dehiscens.

"Burma-Tibet Frontier: Valley of the Seinghku. Alt. 11,000 ft. Flowers pale violet; calyx and scape mealy. 30th July 1926." F. K. Ward. No. 7228. *Type*.

"Seinghku Wang. Lat. 28° 8' N. Long. 97° 24' E. Alt. 10,500-11,500 ft. Flowers pale violet, only just opening. Inflorescence and scape mealy. On rather exposed earth slopes and banks, sometimes under the shelter of boulders. Soil a gritty loam. 4th July 1926." F. K. Ward. No. 7040.

"Valley of the Seinghku. Lat. 28° 10' N. Long. 97° 20' E. Alt. 11,000 ft. Fruit of Nos. 7040, 7228. The plant has set abundant good seed, which is the more remarkable in that it flowers in July, and a large number of plants, growing in poor soil on the rocks in very exposed positions, have the flowers reduced to one. Plants growing under shelter sometimes have 4 or 5 flowers, never more. There are only a few hundred plants in a short stretch of rocky gully. 6th Oct. 1926." F. K. Ward. No. 7551.

A delicate-flowered Soldanelloid, undoubtedly nearest akin to *P. Cawdoriana* but with very different leaves and smaller flowers. It recalls also *P. spicata*, Franch. and its ally *P. penduliflora*, Franch.